CLEAR CREEK

MONROE COUNTY

2004 Fish Management Report

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EXECUTIVE SUMMARY

- Clear Creek begins in Monroe County on the south side of Bloomington, Indiana. This stream drains approximately 76 square mi and flows south approximately 15 mi to the confluence with Salt Creek in Monroe County. Clear Creek is listed by the Indiana Department of Health as Group 5 (No fish consumption) because of PCB contamination from Westinghouse Manufacturing in Bloomington, Indiana.

- A general stream survey of Clear Creek was conducted October 5 and 6, 2004. Three stations, approximately five river mi apart, were sampled. All species of fish were collected using a Smith-Root tote barge. Available habitat was assessed using the Qualitative Habitat Evaluation Index (QHEI) developed by Ohio EPA. The Index of Biotic Integrity (IBI) was also used to assess stream health based upon the fish community. Water quality, based upon standard parameters, at the time of sampling was good at all stations.

- A total of 1,513 fish was collected. Total weight of all samples was 241 lbs. Twenty-nine species representing eight families were collected. Game species, including smallmouth bass, rock bass, spotted bass and largemouth bass, made up approximately 7% of the fish collected.

- Habitat based upon QHEI averaged 71, indicating acceptable habitat for fish.

- IBI assessment of stream health rated all stations in the "Good" category.

- Stream fishing opportunities for black bass and rock bass are good at Clear Creek. However, the Group 5 status of the stream deems this stream as catch and release only. Stream access is limited to bridge crossings and private property.

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INTRODUCTION

Clear Creek begins in Monroe County on the south side of Bloomington, Indiana. This stream drains approximately 76 square mi and flows south approximately 15 mi to the confluence with Salt Creek in Monroe County (Hoggatt 1975).

Clear Creek is designated a Group 5 (no fish consumption) stream by the Indiana Department of Health (2004) because of Polychlorinated Biphenyl (PCB) contamination from Westinghouse Manufacturing. The Westinghouse Manufacturing plant in Bloomington discharged approximately 200,000 pounds of PCBs to the Winston-Thomas Treatment Plant between 1958 and 1982 when the plant was permanently closed. Since 1974, numerous studies, including fish surveys, have been conducted by private contractors, US Fish and Wildlife Service, and most recently Viacom, the new owner of Westinghouse. There is extensive documentation of the eventual clean-up and remediation of the site (COPA 2000).

Recently, anglers have reported good black bass and rock bass fishing in this stream. A file search to confirm these reports noted that no fish community survey had been conducted by Indiana Department of Natural Resources (IDNR).

The present survey was conducted October 5 and 6, 2004 under work plan 204027. The objective was to conduct a general fish community survey and assess available habitat. This report will cover the findings of the October 5 to 6, 2004 fisheries management survey.

METHODS

Fish sampling effort consisted of three sites approximately five river mi apart (RM 3.2, RM 6.5 and RM 12.0) (Figure 1). Stream width and depth were measured by averaging 15 depths and widths from five transects throughout each station. Station length was measured using a Bushnell® laser range finder. Fish habitat at each station was subjectively evaluated using the Qualitative Habitat Evaluation Index, developed by Ohio EPA (Rankin 1989). Habitat indexing is rated on a total score of seven metrics (0-100) evaluating substrate, fish cover, stream development, riparian width and use, depth, and stream gradient.

Water chemistry parameters were performed according to standard stream survey guidelines. Alkalinity and pH were determined at each station using a Hach® kit.

Conductivity and total dissolved solids were measured with a Hanna HI 9811® meter. Dissolved oxygen and temperature were measured with a YSI 95® DO meter.

All fish were collected using a Smith-Root® Tote Barge equipped with a 2.5 GPP electrofisher. Effort consisted of 0.50 h on-time per sample station. All fish were identified to species level. Game species were measured to the nearest 0.1 in and weighed to the nearest 0.01 lb. Scale samples were taken for age and growth analysis. Non-game species were counted and bulk weighed.

Index of Biotic Integrity (IBI) was incorporated to assess stream health. IBI is a system that incorporates population dynamics of a fish community to assess the environmental conditions of stream ecosystems. These metrics break down the fish community based upon species richness, catch per unit effort (CPUE), fish species tolerance of environmental degradation, feeding and spawning characteristics, fish health, and their relationship to the drainage area from which they were collected. A total of 12 metrics, with a scoring range of 0 to 60, was placed within five categories including: excellent, good, fair, poor and very poor. Categories were established by previous surveys of streams within the Interior Plateau Eco-region (Simon and Dufour 1998).

RESULTS

Water chemistry and fish habitat

Water clarity at the time of sampling was excellent with Secchi disk readings to the bottom at all stations. Dissolved oxygen ranged from 6 to 11 ppm. Water temperature ranged from 51 to 58°F. Waters levels were below normal at the time of sampling. Station lengths ranged from 396 to 642 ft (appendix).

The highest QHEI score was 80.25 at RM 12.0, followed by 75.25 at RM 6.5, and 57.50 at RM 3.2. Scores greater than 60 are generally classified as acceptable habitats for warmwater species of fish (Shipman 1997).

Fishery survey data

A total of 1,513 fish was collected. Total weight of all samples was 241 lbs. Twenty-nine species representing eight families were collected. Longear sunfish were the most abundant by number (39%), followed by rainbow darter (9%), northern hog sucker (8%), bluntnose minnow (7%) and striped shiner (6%). The remaining species

made up 31% of the sample. Stream game fish comprised of rock bass, smallmouth bass, spotted bass, largemouth bass, and flathead catfish made up 7% of the catch.

Sunfish Family (*Centrarchidae*)

Ten species of this family were collected. Members of this popular sportfish family made up 54% of the total catch by number and 36% by weight.

Longear sunfish made up 70% of the sunfish total. The 593 fish collected had a length range of 1.6 to 6.6 in.

There were 43 rock bass collected. Length range was 1.5 to 9.2 in. Seventy-seven percent were 6.0 in and greater. Age data were compared to other streams in the Interior Plateau region (Shipman 1994). Rock bass growth was slightly below average at ages 1 and 2. Growth for older fish was above average (appendix).

The 30 smallmouth bass collected had a length range of 4.7 to 18.2 in. Average length of all smallmouth collected was 10.9 in. Forty-seven percent were 12.0 in and greater. Twenty-two smallmouth were collected in one station, RM 6.5. Smallmouth bass growth was below average at ages 1 and 2, and slightly below average for older fish.

A total of 24 spotted bass was collected. Length range was 2.3 to 12.1 in. Approximately half the catch was young of the year (YOY). Only one fish collected was legal size. Growth was slightly below average at ages 2 and 3. Not enough age 1 and 4 and older fish were collected at assess growth.

Other sunfish collected were bluegill, green sunfish, redear, white crappie and warmouth. The confluence of Clear Creek to Salt Creek is less than 1.5 river mi from the Monroe Reservoir Dam. These species are common in the reservoir.

Minnow Family (*Cyprinidae*)

The six species of this family collected made up 18% of the total catch by number and 30% by total weight. Bluntnose minnow, striped shiner and central stoneroller made up the majority of the minnow catch. Other species collected were redfin shiner, carp and creek chub. The 10 carp collected made up 28% of the total weight of fish collected.

Perch Family (*Percidae*)

Four species of darters were collected. Rainbow darter was the most abundant (n134), followed by greenside darter (n72), johnny darter (n10), and logperch (n6). Darters are common to streams with good water quality and rocky substrates.

Sucker Family (*Catostomidae*)

Four species of suckers were collected. There were 123 northern hog suckers collected. Other suckers collected were white suckers (n45), spotted suckers (n6) and black redhorse (n5). Like the darters, northern hog suckers are common to streams with rocky substrates and good flow.

Herring Family (*Clupeidae*)

Gizzard shad was the only member of this family collected. A total of 16 shad ranging in length from 7.8 to 11.9 in was collected. Shad are common in Monroe Reservoir.

Catfish Family (*Ictaluridae*)

A single 5.8 in black bullhead and a single 5.8 in flathead catfish were collected. These fish were collected at RM 6.5.

Drum Family (*Sciaenidae*)

A single 20.2 in freshwater drum was collected. Drum are common to area streams. This fish was collected at the nearest site (RM 3.2) to the confluence with Salt Creek.

Topminnow Family (*Fundulidae*)

A single blackstripe topminnow was collected at station RM 3.2.

DISCUSSION

Clear Creek is home to 29 species of fish. RM 3.2 had the highest IBI score of 54, followed by RM 6.5 with a score of 52 and RM 12.0 with a score of 48. Scores for

two stations fell within the "good range". RM 3.2 indexed between "good and excellent" (Table 1).

QHEI habitat assessment averaged 71. A score of 60 and above is considered good habitat. The substrate metrics score averaged 15.1 out of possible 20. Clear Creek offers good instream cover. High gradient throughout the stream keeps the siltation of the rocky substrate low. Water chemistry parameters tested indicated good water quality for fish at all stations.

Twenty-three years after PCB contamination was first discovered at the Winston-Thomas treatment plant and the adjacent stretch of Clear Creek in Monroe County, the site is now officially clean to the satisfaction of the State and Federal parties and the City of Bloomington (COPA 2000). The Indiana Department of Health's (IDH) Group 5 status of no fish consumption remains in effect. Small streams with good populations of game fish are often over-fished and end up with unstable game fish populations. In the case of this stream, the IDH Group 5 rating has basically designated Clear Creek a catch and release fishery. Other streams in the state having similar situations with IDH Group 5 ratings have become known for good stream fishing. Clear Creek public access is limited to bridge crossings. Permission should be acquired when accessing through private property.

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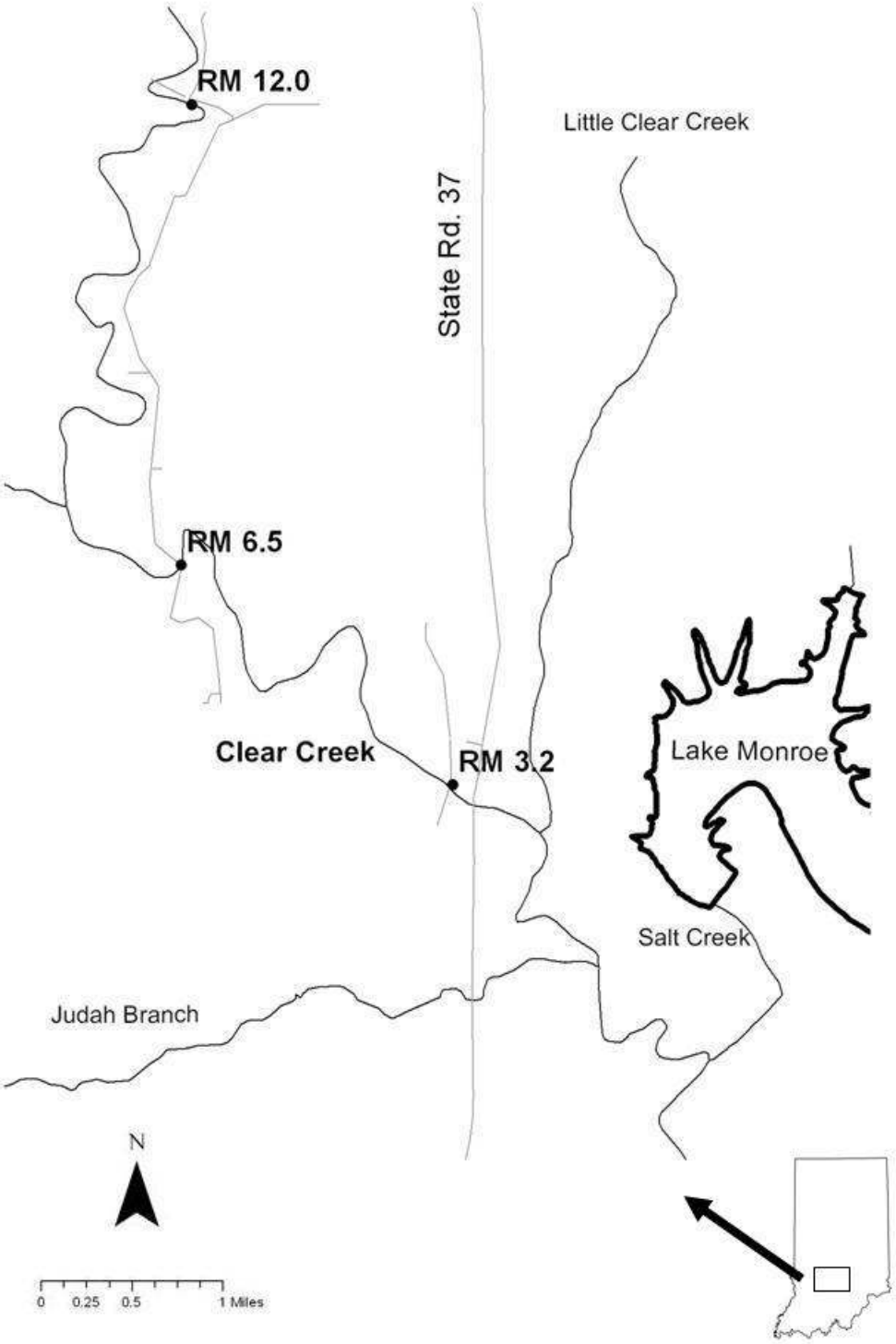

Figure 1. Clear Creek, Monroe County, sample location by river mile (RM), 2004.

Table 1. Index of Biotic Integrity score ranges and description of categories

Integrity Class	Excellent	Good	Fair	Poor	Very Poor	No Fish
Total IBI score	58-60	48-52	40-44	28-34	12-22	0

-"Very Poor" category is described as few fish present, mostly introduced or tolerant forms, hybrids common, disease, parasites and physical anomalies common.

-The "Poor" category is described as being dominated by omnivores and tolerant species, having few top predators, and growth rates and condition factors commonly depressed.

-The "Fair" classification is described as having a loss of intolerant species, increased frequency of omnivores and other tolerant species and an older age class of top predators.

-The "Good" category is described as having species richness somewhat below expectations, especially due to loss of the most intolerant forms; some species are present with less than optimal abundances of size distributions; trophic structures showing some signs of stress.

-"Excellent" is described as comparable to the best situation without human disturbance and a balanced trophic structure.

APPENDIX

Indiana Division of Fish and Wildlife, Stream Habitat Evaluation Form

Qualitative Habitat Evaluation Index score sheet for each station

Station summary for Clear Creek 2004

Name, Number, Percentage, Size, Weight and Occurrence of fish collected at Clear Creek, 2004

Back-calculated length at age for game fish collected at Clear Creek 2004

Length frequency of game fish collected at Clear Creek, 2004